

US EPA ARCHIVE DOCUMENT



The Clear Skies Act of 2003

Alabama and Clear Skies

Highlights of Clear Skies in Alabama

- Alabama sources would reduce emissions of SO₂ by 29%, NO_x by 58%, and mercury by 40% by 2020 due to Clear Skies.
- The health benefits in Alabama would total \$3.1 billion annually (\$570 million under the alternative estimate) and include 200 fewer premature deaths (100 under the alternative estimate) and 500 fewer hospitalizations/emergency room visits each year.
- In addition, Alabama would receive environmental benefits including improved visibility. The value of this benefit for Alabama residents who visit National Parks and Wilderness areas throughout the country would be \$44 million each year by 2020.
- Clear Skies does not significantly impact electricity prices. With or without Clear Skies, electricity prices in the electricity supply region that includes Alabama are expected to remain near 2000 prices.

Clear Skies: An Innovative Approach to Improving Human Health and the Environment

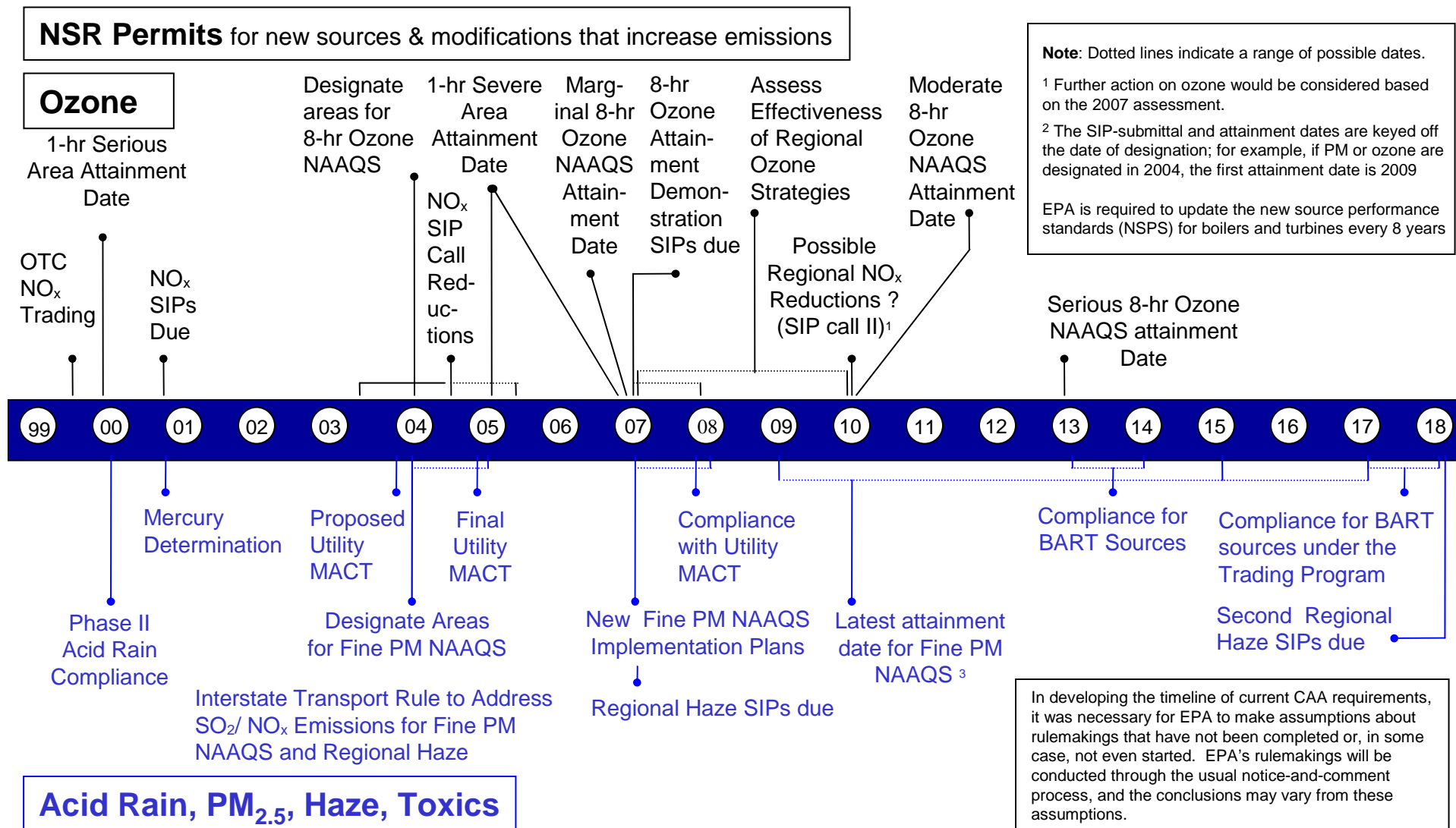
Why Clear Skies?

- **Air quality has improved, but serious concerns persist**
 - Alabama's citizens suffer ill effects from air pollution, including asthma attacks and premature death
- **Electricity generation sector remains a major emissions source**
 - Very cost-effective to control the power sector, relative to other sources
 - Sources are concerned about upcoming complex and burdensome regulations

Advantages of the Clear Skies Approach

- **Guarantees significant nationwide emissions reductions – beginning years before full implementation**
 - Alabama sources would substantially reduce emissions of SO₂, NO_x, and mercury
 - Delivers dramatic progress towards achievement of critical health and environmental goals
- **Uses proven, market-based flexible approach with incentives for innovation**
 - Recognizes environmental needs as well as industry constraints, allowing industry to better manage its operations and finances while lowering risks to the public
 - Sources are projected to install pollution controls to enable continued reliance on coal
- **Increases certainty across the board for industry, regulators, and consumers**

Under Current Clean Air Act Power Plants Would Face a Complex Set of Requirements



Clear Skies Sets a Firm Timeline for Emission Reductions

2004: The NO_x SIP call (summertime NO_x cap in 19 Eastern States + D.C.)

2004

The existing Title IV SO₂ cap-and-trade program provides an incentive and a mechanism to begin reductions upon enactment of Clear Skies years before regulatory action under the current Act.

2008: Clear Skies NO_x Phase I (2.1 million ton annual cap assigned to two Zones with trading programs)

2008

2010: Clear Skies Hg Phase I (26 ton annual cap with a national trading program)

2010

2010: SO₂ Phase I (4.5 million ton annual cap with a national trading program)

2018: Clear Skies NO_x Phase II (1.7 million ton annual cap assigned to two Zones with trading programs)

2018

2018: Clear Skies Hg Phase II (15 ton annual cap with a national trading program)

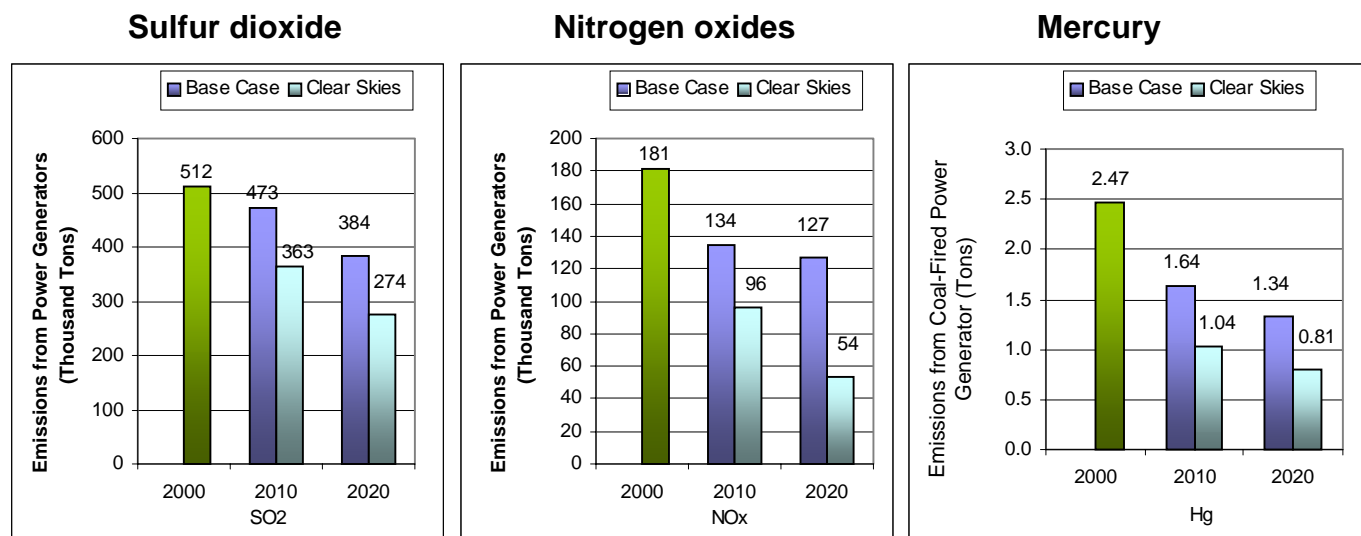
2018: Clear Skies SO₂ Phase II (3.0 million ton annual cap with a national trading program)

Emissions in Alabama under Clear Skies

Emissions in Alabama (2020) would be significantly reduced from 2000 levels:

- 46% reduction in SO₂ emissions
- 70% reduction in NO_x emissions
- 67% reduction in mercury emissions

**Emissions: Current (2000) and Existing Clean Air Act Regulations (base case*)
vs. Clear Skies in Alabama in 2010 and 2020**



Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

Clear Skies Health Benefits in Alabama

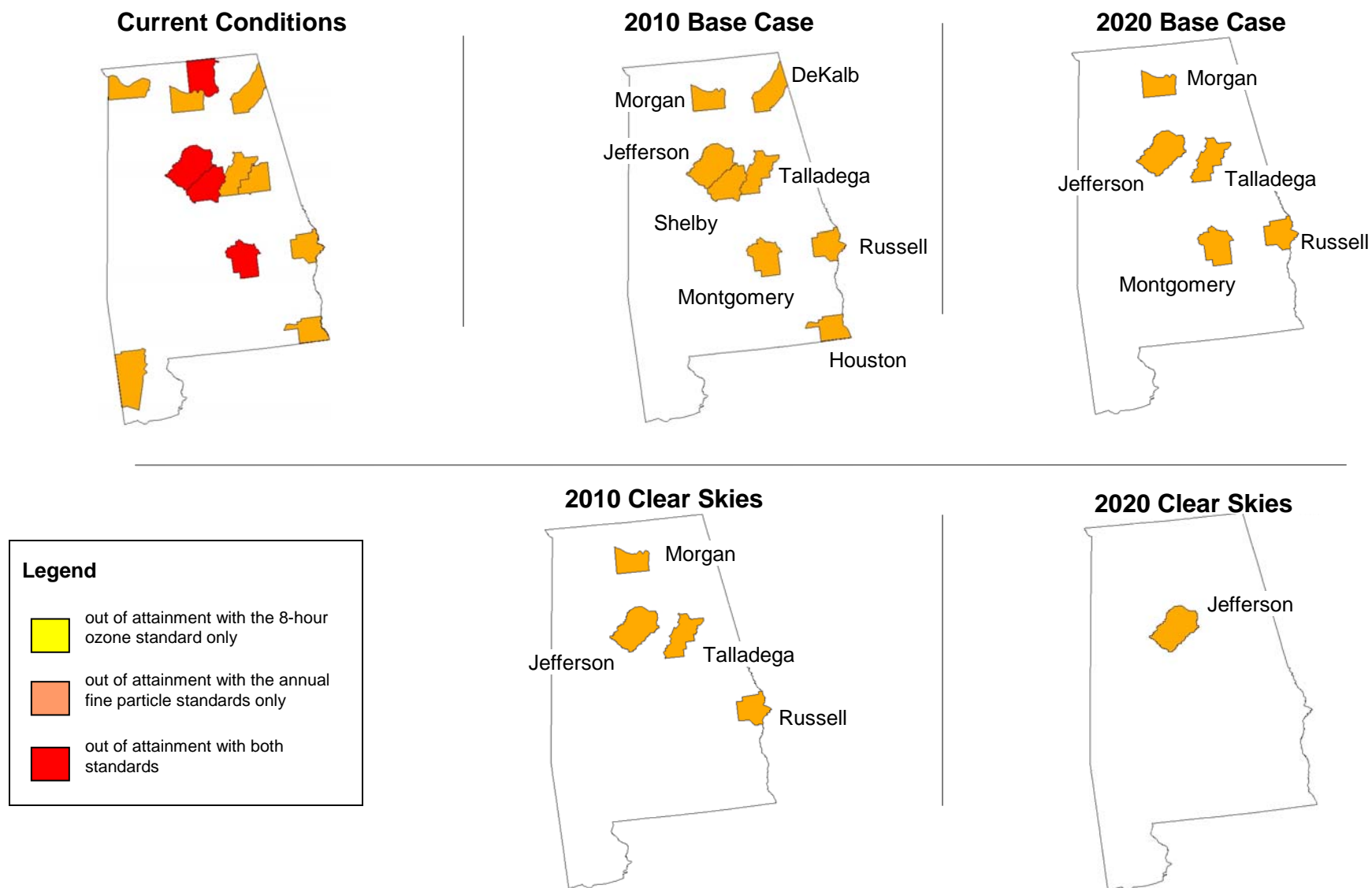
Improve Public Health

- **Reduced ozone and fine particle exposure** by 2020 would result in public health benefits of:
 - approximately 400 fewer premature deaths each year¹
 - approximately 200 fewer cases of chronic bronchitis each year
 - approximately 500 fewer non-fatal heart attacks each year
 - approximately 800 fewer hospital and emergency room visits each year
 - approximately 40,000 fewer days workers are out sick due to respiratory symptoms each year
 - approximately 4,400 fewer school absences each year
- **Reduced mercury emissions** would reduce exposure to mercury through consumption of contaminated fish, resulting in additional, unquantified benefits for those who eat fish from Alabama's lakes, streams, and coastal waters.

By 2020, Alabama would receive approximately \$3.1 billion in annual health benefits from reductions in fine particle and ozone concentrations alone due to Clear Skies.¹

1. An alternative methodology for calculating health-related benefits projects approximately 200 premature deaths prevented and \$570 million in health benefits each year in Alabama by 2020.

Counties Projected to Remain Out of Attainment with the PM_{2.5} and Ozone Standards in Alabama



Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Based on 1999-2001 data of counties with monitors that have three years of complete data.

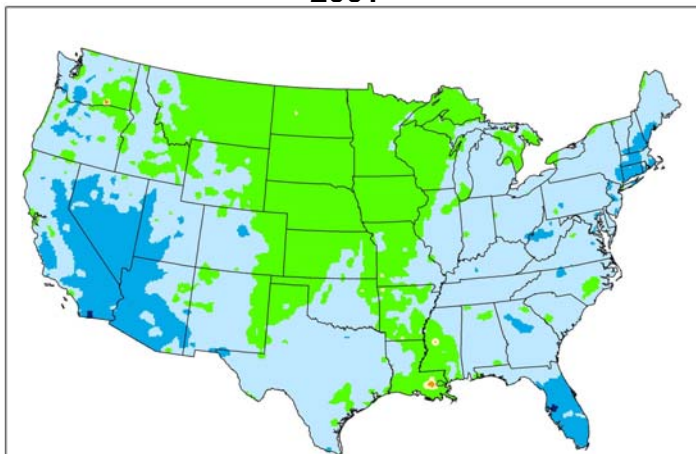
Clear Skies Would Help Alabama Meet Air Quality Standards

- Currently there are 12 counties exceeding the annual fine particle standards and 4 counties exceeding the 8-hour ozone standard.
 - Some of these counties are expected to be brought into attainment with the fine particle standards under existing programs.
 - All of these counties are expected to be brought into attainment with the ozone standard under existing programs.
- **Clear Skies would significantly improve air quality in Alabama** further and more quickly than what is expected from existing programs.
 - By 2010, Clear Skies would bring 4 remaining non-attainment counties (DeKalb, Shelby, Montgomery, and Houston--population approximately 500,000) into attainment with the annual fine particle standards.
 - By 2020, Clear Skies would bring Morgan, Russell and Talledega counties (pop. 240,000) into attainment with the fine particle standard.
 - By 2020, all counties except Jefferson County are projected to be in attainment with both the annual fine particle and 8-hour ozone standards.
- In addition, Clear Skies would reduce ozone and fine particle concentrations in counties throughout the state and move the remaining non-attainment county for fine particles in Alabama (Jefferson County) closer to attainment.

Note: based on 1999-2001 data of counties with monitors that have three years of complete data.

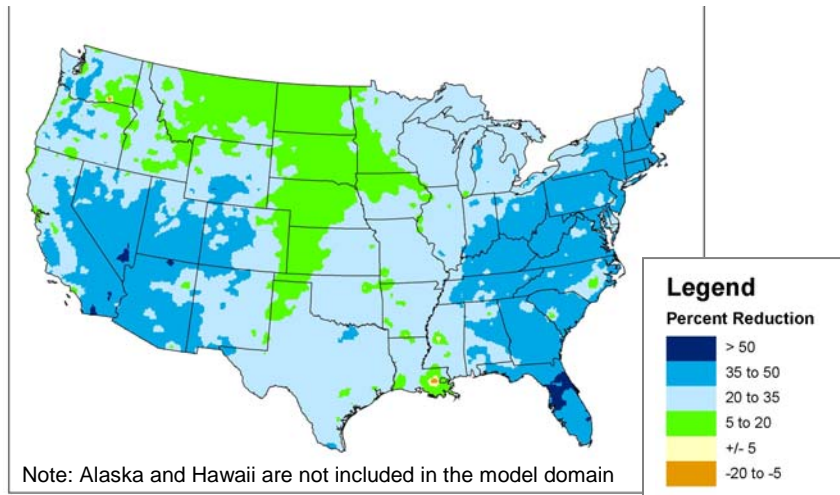
Clear Skies Environmental Benefits in Alabama

Projected Changes in Nitrogen Deposition
with the Base Case in 2020 Compared to
2001



Note: Alaska and Hawaii are not included in the model domain

Projected Changes in Nitrogen Deposition
with Clear Skies and the Base Case in 2020
Compared to 2001



Note: Alaska and Hawaii are not included in the model domain

Clear Skies Would Provide Substantial Environmental Benefits in Alabama

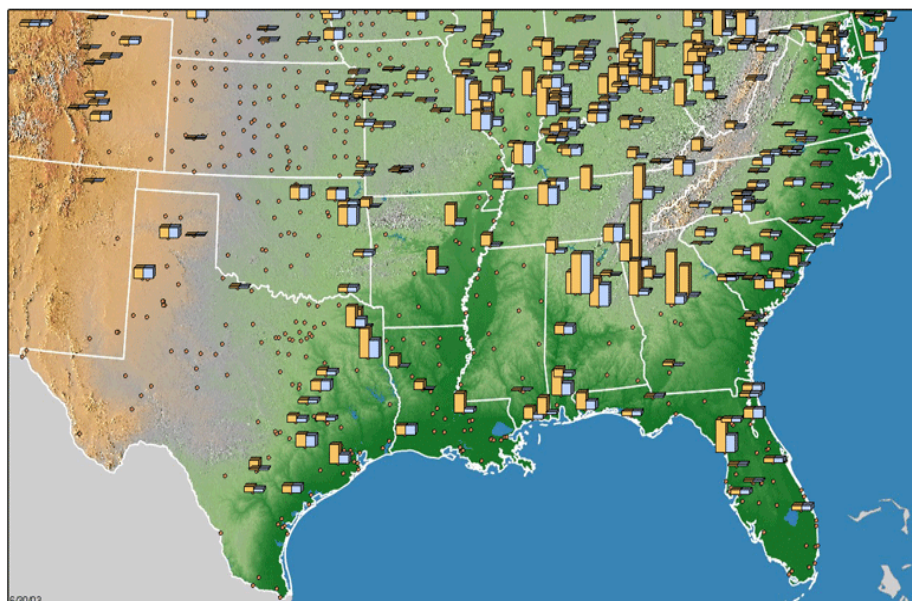
In comparison to existing programs,

- **Visibility would improve** perceptibly. The value of improved visibility for the Sipsey Wilderness area is \$1.6 million.
 - The value of this benefit for Alabama residents who visit National Parks and Wilderness areas throughout the country would be \$50 million each year by 2020.
- **Sulfur deposition, a primary cause of acid rain, would decrease 15-30%** throughout the state.
- **Nitrogen deposition, a cause of damage in nitrogen-sensitive coastal waters, would decrease 5-20%** throughout Alabama.
- **Mercury deposition would decrease up to 15%** in most of the state.*

* These results are based on modeling the Clear Skies mercury cap without triggering the safety valve.

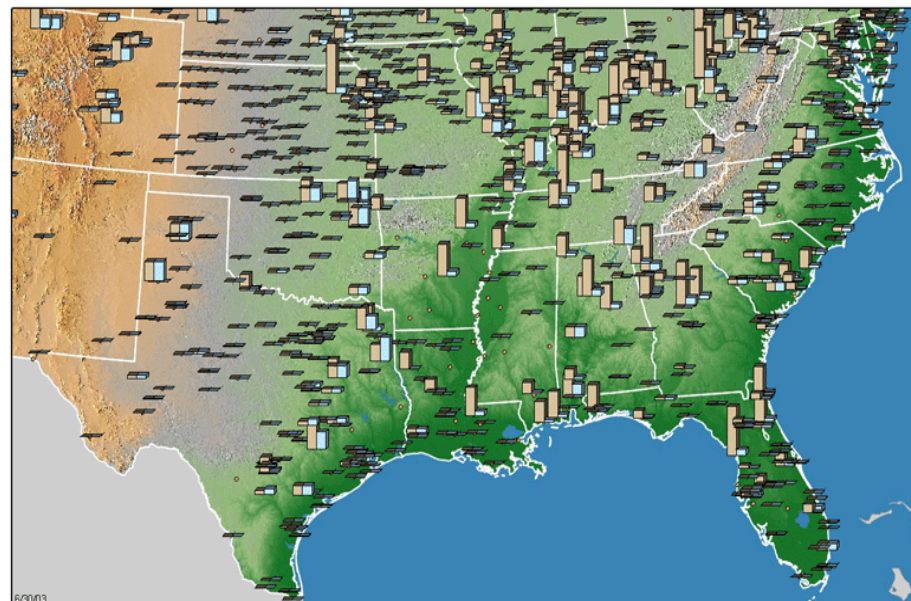
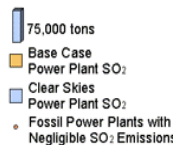
SO₂ and NO_x Emissions Reductions under Clear Skies

Emissions in Alabama and surrounding states would decrease considerably. These emission reductions would make it much easier for Alabama to maintain compliance with the national air quality standards.



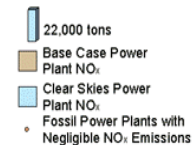
Projected SO₂ Emissions from Power Plants
with the Base Case and Clear Skies (2020)

South



Projected NO_x Emissions from Power Plants
with the Base Case and Clear Skies (2020)

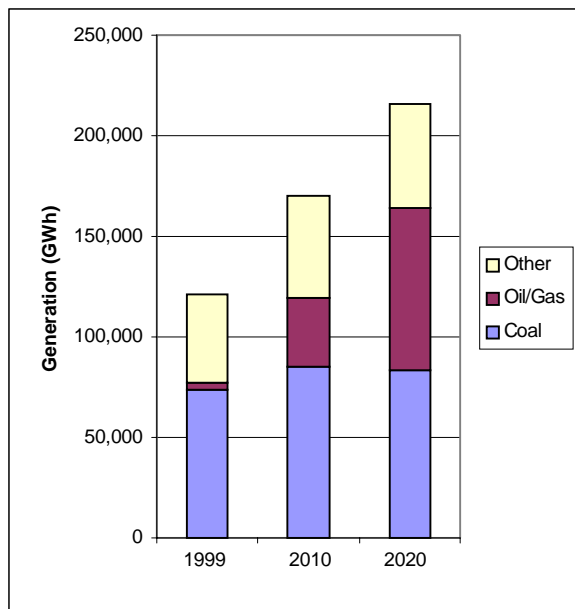
South



Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

Electricity Generation in Alabama under Clear Skies

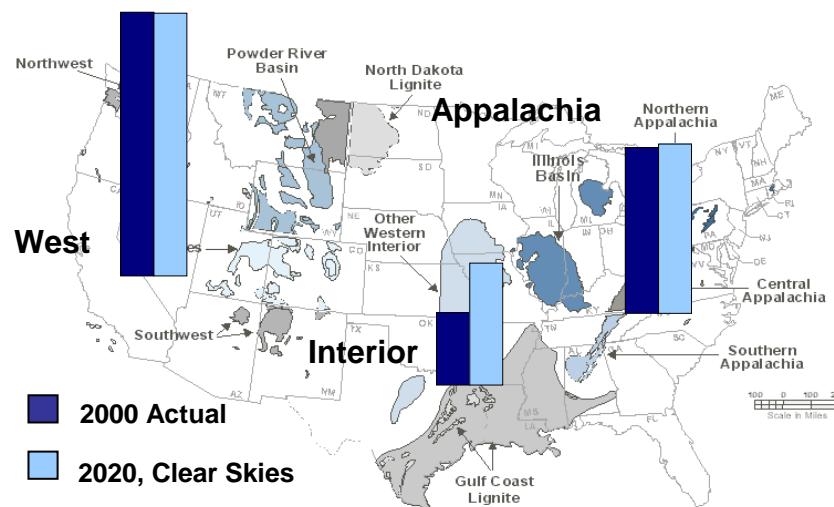
Current and Projected Generation by Fuel Type in Alabama under Clear Skies (GWh)



- Alabama's electricity growth is projected to be met by increases in gas-fired and coal-fired generation. Clear Skies does not significantly alter this projection.
 - Electricity from coal-fired generation will increase by 13% from 1999 to 2020.

- Alabama's sources are projected to reduce their emissions through the installation of emission controls, rather than from a switch from coal to natural gas.
 - In 2010, 46% of Alabama's coal-fired generation is projected to come from units with advanced SO₂ and/or NO_x control equipment that also substantially reduce mercury emissions; in 2020, the percentage is projected to increase to 80%.
 - No coal-fired units in Alabama are projected to be removed from operation as a result of Clear Skies.

Current and Projected Coal Production for Electricity Generation



Scale: Appalachia 2000 = 299 million tons

Emission Controls in Alabama under Clear Skies

- **Under Clear Skies by 2020...**

- 16% of coal-fired capacity would install SCR
- 22% would install scrubbers

- **The major generation companies in Alabama include:**

- Alabama Power Co.
- Tennessee Valley Authority

- **Total coal-fired capacity in Alabama is projected to be 11,475 MW in 2010.**

Units in Alabama Projected to Be Retrofitted Due to Clear Skies by 2020

Plant Name	Unit ID	Technology
BARRY	4	Scrubber
BARRY	5	Scrubber
COLBERT	1	Scrubber*/ SCR*
COLBERT	2	Scrubber*/ SCR*
COLBERT	3	Scrubber*/ SCR*
COLBERT	4	Scrubber*/ SCR*
GORGAS	10	Scrubber*
CHARLES R LOWMAN	2	SCR*
CHARLES R LOWMAN	3	SCR*
JAMES H MILLER JR	2	SCR

* Retrofit was installed under Clear Skies by 2010

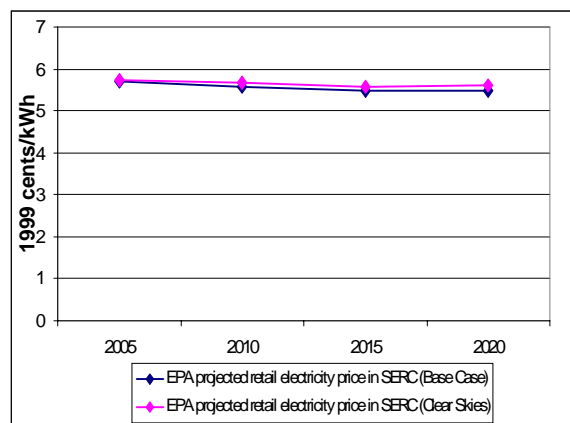
Note: Retrofits and total coal-fired capacity apply to coal units greater than 25 MW.

Electricity Prices in Alabama under Clear Skies

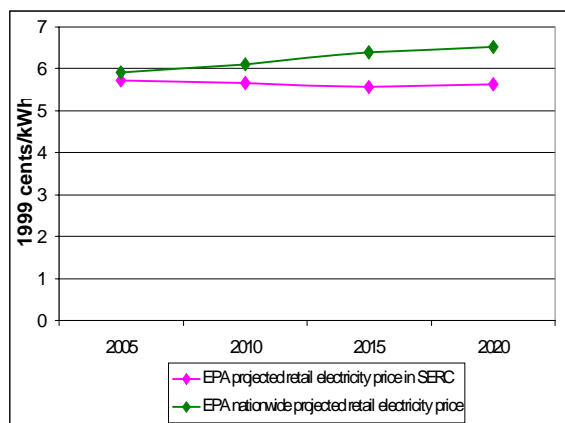
- With or without Clear Skies, retail prices in the North American Electric Reliability Council (NERC) SERC region (the electricity supply region that contains Alabama) are projected to decrease between 2005 and 2020.
- With Clear Skies, retail prices are projected to be approximately 0.7 – 2.8% higher between 2005 and 2020 than in the absence of the legislation.



Projected Retail Electricity Prices in Alabama under the Base Case and Clear Skies (2005-2020)



Projected National Retail Electricity Prices and Prices in Alabama under Clear Skies (2005-2020)



In 2000, the average retail electricity price in Alabama was approximately 5.6 cents/kWh, which was below the average *national* retail price of approximately 6.7 cents/kWh.

Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

Costs and Benefits in Alabama under Clear Skies

Benefits Outweigh the Costs

- In Alabama, Clear Skies is projected to cost approximately \$287 million annually by 2020 while providing health benefits totaling approximately \$3.1 billion annually.
- The increases in production costs under Clear Skies represent only a small percentage of total retail electricity sales revenue in Alabama.
 - Retail electricity sales revenue in Alabama was almost \$4.7 billion in 2000.
 - Adjusting these sales revenues by the same growth rate used for the modeling of costs would result in revenues of over \$7.2 billion annually in 2020.
- Nationwide, the projected annual costs of Clear Skies (in \$1999) are \$4.3 billion in 2010 and \$6.3 billion in 2020; the nationwide benefits of Clear Skies are expected to be over \$113 billion annually by 2020.
 - An alternate estimate projects annual health benefits totaling \$23 billion.

Note: Costs include capital costs, fuel, and other operation and maintenance costs (both fixed and variable) associated with the achievement of the emissions caps in the legislation (for example, the installation and operation of pollution controls). These state-level production costs are estimates; they do not account for the costs associated with the transfer of electricity across regions, nor the costs or savings that could be associated with allowance movement between sources.

Clear Skies....

- Guarantees significant emissions reductions – beginning years before full implementation
- Uses a proven and flexible market-based approach with incentives for innovation
- Increases certainty across the board for industry, regulators, and consumers

Notes on EPA's Analysis

- The information presented in this analysis reflects EPA's modeling of the Clear Skies Act of 2003.
 - EPA has updated this information to reflect modifications:
 - Changes included in the Clear Skies Act of 2003.
 - Revisions to the Base Case to reflect newly promulgated rules at the state and federal level since the initial analysis was undertaken.
 - The Clear Skies modeling results presented include the safety valve feature
 - This analysis compares new programs to a Base Case (Existing Control Programs), which is typical when calculating costs and benefits of Agency rulemakings.
 - The Base Case reflects implementation of current control programs only:
 - Does not include yet-to-be developed regulations such as those to implement the National Ambient Air Quality Standards.
 - The EPA Base Case for power sector modeling includes:
 - Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in Connecticut, Massachusetts, Missouri, New Hampshire, North Carolina, Texas, and Wisconsin finalized before March 2003.
 - For air quality modeling, the Base Case also includes federal and state control programs, as well as the Tier II, Heavy Duty Diesel, and Non-Road Diesel rules.
- **For more information regarding the Clear Skies Act, please visit the EPA website:**

(<http://www.epa.gov/clearskies>)

